

Jakks Pacific (HK) Limited

Application
For
Certification
(FCC ID: OTATM80645)

Transceiver

Sample Description : Laser Challenge Communications, Model : 80645

We hereby certify that the sample of the above item is considered to comply with the requirements
of FCC Part 15, Subpart C for Intentional Radiator,
mention 47 CFR [24-5-2001]

0308066
WN/at
June 5, 2003

- The test results reported in this report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
- This report shall not be reproduced except in full without prior authorization from Intertek Testing Services Hong Kong Limited.
- The evaluation data of the report will be kept for 3 years from the date of issuance.

FCC ID : OTATM80645

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MEASUREMENT/TECHNICAL REPORT

Jakks Pacific (HK) Limited - MODEL: 80645
FCC ID: OTATM80645

June 5, 2003

This report concerns (check one): Original Grant X Class II Change

Equipment Type: Transceiver (example: computer, printer, modem, etc.)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes No X

If yes, defer until:
date

Company Name agrees to notify the Commission by:
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes No X

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [24-5-2001 Edition] provision.

Report prepared by: Wilbur Ng
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List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Report	Bandwidth Plot	bw.pdf
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf

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EXHIBIT 1

GENERAL DESCRIPTION

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1.0 **General Description**

1.1 Product Description

The equipment under (EUT) is a transceiver for a Walkie Talkie operating at 27.145 MHz and 49.860 MHz which are controlled by two crystals. The EUT is powered by a 9V battery for the transmitter and receiver and three AA batteries for the laser gun. The EUT has three switches and six buttons. The two switches locate at the laser gun are used to switch ON/OFF the walkie talkie and select the communication channel. The switch on the chest receiver is used for select the ON/OFF and try me mode of the laser gun. Another five buttons locate at the laser gun are used to reset, set mode, reload, trigger the laser gun and switch the walkie talkie from receiver mode to transmit mode and vice versa. The button on the chest receiver is used to ON/OFF the shield.

The brief circuit description is saved with filename : descri.pdf

1.2 Related Submittal(s) Grants

This is a single application for certification of a transmitter. The receiver for this transmitter is authorized by 15 Verification procedure.

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1.3 Test Methodology

The radiated emission measurements were performed according to the procedures in ANSI C63.4 (1992). All measurements were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. For each scan, the procedure for maximizing emissions in Appendices D and E were followed. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the emission data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.

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EXHIBIT 2

SYSTEM TEST CONFIGURATION

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2.0 **System Test Configuration**

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (1992.)

The EUT was powered by a new 9V battery and three AA batteries during test.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The unit was operated standalone and placed in the center of the turntable.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on a turn table, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

For simplicity of testing, the unit was wired to transmit continuously.

2.2 EUT Exercising Software

There was no special software to exercise the device.

2.3 Special Accessories

There are no special accessories necessary for compliance of this product.

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2.4 Equipment Modification

Any modifications installed previous to testing by Jakks Pacific (HK) Limited will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Intertek Testing Services.

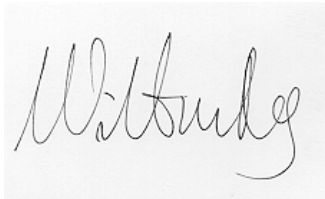
2.5 Support Equipment List and Description

This product was tested in a standalone configuration.

All the items listed under section 2.0 of this report are

Confirmed by:

*Wilbur Ng
Manager
Intertek Testing Services
Agent for Jakks Pacific (HK) Limited*



Signature

June 5, 2003

Date

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EXHIBIT 3

EMISSION RESULTS

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3.0 **Emission Results**

Data is included worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

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3.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD + AV$$

where FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

PD = Pulse Desensitization in dB

AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD + AV$$

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3.1 Field Strength Calculation (cont'd)

Example

Assume a receiver reading of 62.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 62.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$PD = 0 \text{ dB}$$

$$AV = -10 \text{ dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 \text{ dB}\mu\text{V/m}$$

$$\text{Level in mV/m} = \text{Common Antilogarithm} [(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

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3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission (27.145 MHz)

81.435 MHz

Worst Case Radiated Emission (49.860 MHz)

548.451 MHz

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos.pdf

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3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 0.2 dB (27.145 MHz)

Judgement: Passed by 1.0 dB (49.860 MHz)

TEST PERSONNEL:



Signature

Anthony K. M. Chan, Compliance Engineer
Typed/Printed Name

June 5, 2003
Date

INTERTEK TESTING SERVICES

Company: Jakks Pacific (HK) Limited
Model: 80645
Worst-case operating mode: 27.145 MHz

Date of Test: May 25, 2003

Table 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB μ V/ m)	Limit at 3m (dB μ V/ m)	Margin (dB)
V	27.145	67.0	14.0	16.0	65.0	80.0	-15.0
V	54.290	36.6	11.0	16.0	31.6	40.0	-8.4
H	81.435	48.8	7.0	16.0	39.8	40.0	-0.2
H	108.580	40.8	13.0	16.0	37.8	43.5	-5.7
H	135.725	43.0	13.0	16.0	40.0	43.5	-3.5
H	162.870	37.3	16.0	16.0	37.3	43.5	-6.2
H	190.016	36.2	16.0	16.0	36.2	43.5	-7.3
H	217.159	34.5	17.0	16.0	35.5	46.0	-10.5
H	244.306	39.0	20.0	16.0	43.0	46.0	-3.0
H	271.451	39.2	22.0	16.0	45.2	46.0	-0.8

- Notes:
1. Peak Detector Data unless otherwise stated.
 2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3 meter distance were measured at 0.3 meter and an inverse proportional extrapolation was performed to compare the signal level to the 3 meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3 meter.
 3. Negative value in the margin column shows emission below limit.
 4. Horn antenna are used for the emission over 1000MHz.

*Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and peak detector data with average factor for frequencies over 1000 MHz.

Test Engineer: Anthony K. M. Chan

INTERTEK TESTING SERVICES

Company: Jakks Pacific (HK) Limited
Model: 80645
Worst-case operating mode: 49.860 MHz

Date of Test: May 25, 2003

Table 2

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB μ V/ m)	Limit at 3m (dB μ V/ m)	Margin (dB)
V	49.862	61.6	11.0	16.0	56.6	80.0	-23.4
H	99.720	42.0	11.0	16.0	37.0	43.5	-6.5
H	149.579	39.6	13.0	16.0	36.6	43.5	-6.9
H	199.437	39.2	16.0	16.0	39.2	43.5	-4.3
H	249.296	40.8	20.0	16.0	44.8	46.0	-1.2
H	299.155	30.0	22.0	16.0	36.0	46.0	-10.0
H	349.014	30.1	24.0	16.0	38.1	46.0	-7.9
H	398.876	26.5	25.0	16.0	35.5	46.0	-10.5
H	448.735	14.0	26.0	16.0	24.0	46.0	-22.0
H	548.451	33.0	28.0	16.0	45.0	46.0	-1.0
H	598.310	31.7	29.0	16.0	44.7	46.0	-1.3
H	648.172	25.0	29.0	16.0	38.0	46.0	-8.0

- Notes:
1. Peak Detector Data unless otherwise stated.
 2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3 meter distance were measured at 0.3 meter and an inverse proportional extrapolation was performed to compare the signal level to the 3 meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3 meter.
 3. Negative value in the margin column shows emission below limit.
 4. Horn antenna are used for the emission over 1000MHz.

*Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and peak detector data with average factor for frequencies over 1000 MHz.

Test Engineer: Anthony K. M. Chan

FCC ID: OTATM80645

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EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

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4.0 **Equipment Photographs**

For electronic filing, the photographs are saved with filename:
external photos.pdf and internal photos.pdf

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EXHIBIT 5

PRODUCT LABELLING

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5.0 **Product Labelling**

For electronic filing, the FCC ID label artwork and the label location are saved with filename: label.pdf

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EXHIBIT 6

TECHNICAL SPECIFICATIONS

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6.0 **Technical Specifications**

For electronic filing, the block diagram and schematics are saved with filename:
block.pdf and circuit.pdf

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EXHIBIT 7

INSTRUCTION MANUAL

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7.0 **Instruction Manual**

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf

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EXHIBIT 8

MISCELLANEOUS INFORMATION

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8.0 **Miscellaneous Information**

This miscellaneous information includes details of the measured bandwidth.

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8.1 Measured Bandwidth

For electronic filing, the plot shows the fundamental emission when modulated with 1 kHz and 100 dB SPL, 10 cm from the Microphone of EUT and unmodulated are saved with filename: bw.pdf.

The plot saved in bw.pdf which shows the fundamental emission is confined in the specified band. And it also shows that the emission is at least 69.9 dB below the carrier level at the band edge (26.96 and 27.28 MHz). It meets the requirement of Section 15.227(b).

The plot saved in bw.pdf which shows the fundamental emission is confined in the specified band. The field strength of any emission appearing between the band edges and up to 10kHz above and below the band edges (49.81 and 49.91 MHz) is at least 26 dB below the carrier level. And at 49.81 & 49.91 MHz, there are at least 50.0 dB below the carrier level. It meets requirement of Section 15.235(b).

Figure 8.1 Bandwidth

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8.2 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitters operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 1992.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The wood is adjusted through all three orthogonal axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 450 kHz to 30 MHz.

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8.2 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements are made as described in ANSI C63.4 - 1992.

The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.2). Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the restricted bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, but those measurements taken at a closer distance are so marked.

When determining the test result, the Measurement Uncertainty of the test has been considered.